AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claim 1 (Original): A process for producing a phosphonium borate compound, which comprises:

reacting a phosphine with HCl to produce a phosphine hydrochloride, the phosphine being represented by Formula (II):

$(R^1)(R^2)(R^3)P$ (II)

wherein R^1 is a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, or a cycloalkyl group of 3 to 20 carbon atoms;

R^2 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, or an allyl group of 3 to 20 carbon atoms;

R^3 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aryl group of 6 to 30 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, an alkenyl group of 2 to 20 carbon atoms, an alkynyl group of 2 to 20 carbon atoms, or an allyl group of 3 to 20 carbon atoms; and

R^1, R^2 and R^3 may be the same or different from one another;

the phosphine hydrochloride being represented by Formula (III):

$(R^1)(R^2)(R^3)PH{\cdot}Cl$ (III)

wherein R^1, R^2 and R^3 are as defined in Formula (II);

and

reacting the phosphine hydrochloride with a tetraarylborate compound represented by Formula (IV):

$M{\cdot}BAr_4$ (IV)

wherein M is lithium, sodium, potassium, magnesium halide or calcium halide, and Ar is an aryl group of 6 to 20 carbon atoms;

the phosphonium borate compound being represented by Formula (I):

$(R^1)(R^2)(R^3)PH{\cdot}BAr_4$ (I)

wherein R^1, R^2 and R^3 are as defined in Formula (II), and Ar is as defined in Formula (IV).

Claim 2 (Original): A process for producing a trialkylphosphonium tetraphenylborate according to claim 1, which comprises:

reacting a trialkylphosphine with HCl to produce a trialkylphosphine hydrochloride, the trialkylphosphine being represented by Formula (II):

$(R^1)(R^2)(R^3)P$ (II)

wherein R^1, R^2 and R^3 are ethyl, n-butyl, tert-butyl or cyclohexyl groups, and are the same;

the trialkylphosphine hydrochloride being represented by Formula (III):

$(R^1)(R^2)(R^3)PH{\cdot}Cl$ (III)

wherein R^1, R^2 and R^3 are as defined in Formula (II);

and

reacting the trialkylphosphine hydrochloride with a tetraphenylborate compound represented by Formula (IV):

$M{\cdot}BAr_4$ (IV)

wherein M is lithium, sodium, potassium, magnesium halide or calcium halide, and Ar is phenyl group;

the trialkylphosphonium tetraphenylborate being represented by Formula (I):

$(R^1)(R^2)(R^3)PH{\cdot}BAr_4$ (I)

wherein R^1, R^2 and R^3 are as defined in Formula (II), and Ar is as defined in Formula (IV).

Claim 3 (Original): A process for producing a novel phosphonium borate compound according to claim 1, which comprises:

reacting a phosphine with HCl to produce a phosphine hydrochloride, the phosphine being represented by Formula (II):

$(R^1)(R^2)(R^3)P$ (II)

wherein R^1 is a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, or a cycloalkyl group of 3 to 20 carbon atoms;

R^2 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, or an allyl group of 3 to 20 carbon atoms;

R^3 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aryl group of 6 to 30 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, an alkenyl group of 2 to 20 carbon atoms, an alkynyl group of 2 to 20 carbon atoms, or an allyl group of 3 to 20 carbon atoms; and

R^1, R^2 and R^3 may be the same or different from one another;

the phosphine hydrochloride being represented by Formula (III):

$(R^1)(R^2)(R^3)PH{\cdot}Cl$ (III)

wherein R^1, R^2 and R^3 are as defined in Formula (II);

and

reacting the phosphine hydrochloride with a tetraarylborate compound represented by Formula (IV):

$M{\cdot}BAr_4$ (IV)

wherein M is lithium, sodium, potassium, magnesium halide or calcium halide, and Ar is an aryl group of 6 to 20 carbon atoms;

the phosphonium borate compound being represented by Formula (I):

$(R^1)(R^2)(R^3)PH{\cdot}BAr_4$ (I)

wherein R^1, R^2 and R^3 are as defined in Formula (II), Ar is as defined in Formula (IV), R^1, R^2 and R^3 cannot be tert-butyl groups simultaneously and Ar cannot be phenyl group at the same time, and R^1, R^2 and R^3 cannot be cyclohexyl groups simultaneously and Ar cannot be phenyl group at the same time.

Claim 4 (Original): A process for producing a phosphonium borate compound, which comprises:

reacting a phosphine with H_2SO_4 to produce a phosphine sulfate, the

phosphine being represented by Formula (II):

$(R^1)(R^2)(R^3)P$ (II)

wherein R^1 is a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, or a cycloalkyl group of 3 to 20 carbon atoms;

R^2 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, or an allyl group of 3 to 20 carbon atoms;

R^3 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aryl group of 6 to 30 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, an alkenyl group of 2 to 20 carbon atoms, an alkynyl group of 2 to 20 carbon atoms, or an allyl group of 3 to 20 carbon atoms; and

R^1, R^2 and R^3 may be the same or different from one another;

the phosphine sulfate being represented by Formula (V):

$[(R^1)(R^2)(R^3)PH]_{(2-n)}\cdot H_nSO_4$ (V)

wherein R^1, R^2 and R^3 are as defined in Formula (II), and n is an integer of 0 or 1;

and

reacting the phosphine sulfate with a tetraarylborate compound represented by Formula (IV):

$M\cdot BAr_4$ (IV)

wherein M is lithium, sodium, potassium, magnesium halide or calcium halide, and Ar is an aryl group of 6 to 20 carbon atoms;

the phosphonium borate compound being represented by Formula (I):

$(R^1)(R^2)(R^3)PH\cdot BAr_4$ (I)

wherein R^1, R^2 and R^3 are as defined in Formula (II), and Ar is as defined in Formula (IV).

Claim 5 (Original): A process for producing a trialkylphosphonium

tetraphenylborate according to claim 4, which comprises:

reacting a trialkylphosphine with H_2SO_4 to produce a trialkylphosphine sulfate, the trialkylphosphine being represented by Formula (II):

$(R^1)(R^2)(R^3)P$ (II)

wherein R^1, R^2 and R^3 are ethyl, n-butyl, tert-butyl or cyclohexyl groups, and are the same;

the trialkylphosphine sulfate being represented by Formula (V):

$[(R^1)(R^2)(R^3)PH]_{(2-n)}\cdot H_nSO_4$ (V)

wherein R^1, R^2 and R^3 are as defined in Formula (II), and n is an integer of 0 or 1;

and

reacting the trialkylphosphine sulfate with a tetraphenylborate compound represented by Formula (IV):

$M\cdot BAr_4$ (IV)

wherein M is lithium, sodium, potassium, magnesium halide or calcium halide, and Ar is phenyl group;

the trialkylphosphonium tetraphenylborate being represented by Formula (I):

$(R^1)(R^2)(R^3)PH\cdot BAr_4$ (I)

wherein R^1, R^2 and R^3 are as defined in Formula (II), and Ar is as defined in Formula (IV).

Claim 6 (Original): A process for producing a novel phosphonium borate compound according to claim 4, which comprises:

reacting a phosphine with H_2SO_4 to produce a phosphine sulfate, the phosphine being represented by Formula (II):

$(R^1)(R^2)(R^3)P$ (II)

wherein R^1 is a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, or a cycloalkyl group of 3 to 20 carbon atoms;

R^2 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, or an

allyl group of 3 to 20 carbon atoms;

R^3 is a hydrogen atom, a primary alkyl group of 1 to 20 carbon atoms, a secondary alkyl group of 3 to 20 carbon atoms, a tertiary alkyl group of 4 to 20 carbon atoms, a cycloalkyl group of 3 to 20 carbon atoms, an aryl group of 6 to 30 carbon atoms, an aralkyl group of 7 to 20 carbon atoms, an alkenyl group of 2 to 20 carbon atoms, an alkynyl group of 2 to 20 carbon atoms, or an allyl group of 3 to 20 carbon atoms; and

R^1, R^2 and R^3 may be the same or different from one another;

the phosphine sulfate being represented by Formula (V):

$$[(R^1)(R^2)(R^3)PH]_{(2-n)}\cdot H_nSO_4 \qquad (V)$$

wherein R^1, R^2 and R^3 are as defined in Formula (II), and n is an integer of 0 or 1;

and

reacting the phosphine sulfate with a tetraarylborate compound represented by Formula (IV):

$$M\cdot BAr_4 \qquad (IV)$$

wherein M is lithium, sodium, potassium, magnesium halide or calcium halide, and Ar is an aryl group of 6 to 20 carbon atoms;

the phosphonium borate compound being represented by Formula (I):

$$(R^1)(R^2)(R^3)PH\cdot BAr_4 \qquad (I)$$

wherein R^1, R^2 and R^3 are as defined in Formula (II), Ar is as defined in Formula (IV), R^1, R^2 and R^3 cannot be tert-butyl groups simultaneously and Ar cannot be phenyl group at the same time, and R^1, R^2 and R^3 cannot be cyclohexyl groups simultaneously and Ar cannot be phenyl group at the same time.

Claims 7-16 (Cancelled).